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COMPLETE SPECIFICATION

Improvements in Screw Presses

I, HANS ANDREAS HARTNER, a Norwegian Subject, of Bygdo Alle, 45, Oslo, Norway, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to screw presses for expressing liquid from a mass bearing same and is concerned with that kind of screw press wherein a pair of intermeshing screws are rotatably arranged within a perforated or apertured casing, the threads of the screws intermeshing with considerable lateral clearance between their threads relative to the thickness of the latter, and the core and thread diameters being relatively varied so that the volumetric capacity of the space between adjacent turns of the thread of each screw decreases from the inlet to the outlet of the press in order to effect the desired compressing of the mass and consequent expulsion of liquid therefrom. A screw press of this kind is described in British Patent Specification No. 458,970 which also features a decrease in the pitch of the threads at the outlet end of the press.

The object of the present invention is to provide an improved screw press of the kind referred to particularly intended for the expressing of oil and water from a boiled herring mass.

I am aware that a screw press having a pair of intermeshing rotatable screws within a perforated casing has hitherto been proposed wherein the width of the thread of each screw is such that it completely fills the groove of its complementary screw, the decrease in volumetric capacity being effected either by decreasing the diameter of the threads towards the outlet of the press together with a corresponding increase of the core diameter of each screw, or by decreasing the pitch and thread width towards said outlet end.

A screw press of the kind referred to and according to this invention is characterized by the variation of the core diameter of each screw being such that in a plane through the axes of both screws the thread of each screw in meshing between the thread of its complementary screw is in substantial peripheral contact with the core of the latter throughout the operative length of the screws.

In order that the invention may be clearly understood and readily carried into practical effect reference is had to the accompanying drawings, in which:—

Figures 1 to 3 are diagrammatic sectional elevations of three embodiments of the present invention.

According to Figure 1 both screw axes 1 and 2 respectively are parallel, but their cores 3 and 4 are tapered with a diameter increasing from the mass inlet at 5 towards the outlet at 6. Further the exterior diameter of the threads 7 and 8 respectively decreases towards the outlet. The free cross sectional area of the perforated press case 9 (i.e. its cross sectional area less the cross sectional area of the two screw cores) is thus progressively decreased towards the outlet, whether the thread pitch is constant on the whole screw length or otherwise. However, better results are obtained if the pitch in known manner is decreased towards the outlet as shown in Figure 1. By varying these conditions any desired degree of expression may be obtained.

As shown in Figure 2 the screw axes 1 and 2 are arranged slightly converging towards the outlet 6, and the cores 10 and 11 respectively of both screws are cylindrical. At the same time the press case 9 converges towards the outlet. Most advantageously both screws are then made with a pitch decreasing towards the outlet. Figure 3 shows a modification, wherein the screw cores 12 and 13 respectively are tapered with decreasing diameter towards the outlet.

Good results may also be obtained, if the screw cores are tapered in the opposite direction, thus with a diameter increasing towards the outlet. Any

desired degree of expression may also in that case be obtained by a suitable choice of the angle between the screw axes 1 and 2, the core diameters at the inlet and outlet and the pitch.

As will be seen in the abovementioned cases a great distance is obtained between the screw trunnions 16 and 17 respectively at the inlet 5, so that there is a good space for the two intermeshing driving gears here which may consequently be made with teeth of sufficient strength.

A common feature in all embodiments is that one or more threads next to the outlet 6 may be made with an extra small pitch in order to obtain thereby at least the same resistance to expression of the mass as elsewhere in the press. Moreover, the threads of each screw intermesh right on to the core of the other screw.

In the first case (press with parallel screw axes) short cylindrical thread screws or screw portions with cylindrical cores for feeding in or out the press mass, may be arranged at the inlet and/or the outlet. Moreover, it is desirable to make a portion of the screws next to the outlet as a removable and suitably tubular end piece, which preferably, although not necessarily, is cylindrical. In this way the insertion of end pieces with different thread pitches is permitted in such a manner that the pressure gradient near the outlet may be easily altered and so that one and the same press may be used for varying or different raw materials.

What I claim is:—

1. A screw press of the kind referred to characterized by the variation of the core diameter of each screw being such that in a plane through the axes of both screws the thread of each screw in meshing between the thread of its complementary screw is in substantial peripheral contact with the core of the latter throughout the operative length of the screws.

2. A screw press according to claim 1 wherein the diameter of the screw threads decreases towards the outlet of the press.

3. A screw press according to claim 1 or 2 wherein the core diameters of the screws increase towards the outlet of the press.

4. A screw press according to claim 1 or 2 wherein the core diameters of the screws are constant or decrease towards the outlet of the press.

5. A screw press according to any of the preceding claims wherein the axes of the screws are mutually inclined towards the outlet of the press.

6. A screw press according to any of the preceding claims wherein the pitch of the threads decreases towards the outlet of the press.

7. A screw press according to claim 6 wherein there is a considerable decrease in the pitch of the screw threads next to the outlet.

8. A screw press of the kind referred to substantially as herein described with reference to Figure 1, 2 or 3 of the accompanying drawing.

T. FLETCHER WILSON,
Chartered Patent Agent,
3, Queen's Road, Coventry,
Agent for the Applicant.

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This drawing is a reproduction of the Original on a reduced scale.

Fig. 1.

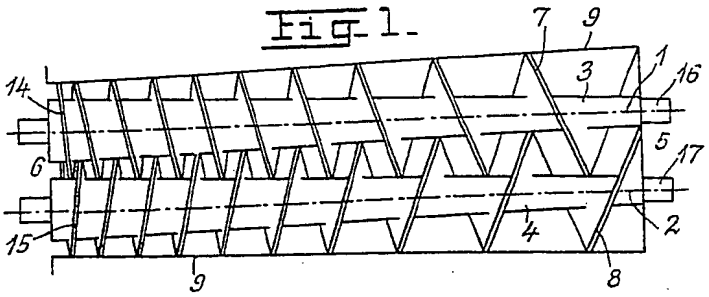


Fig. 2.

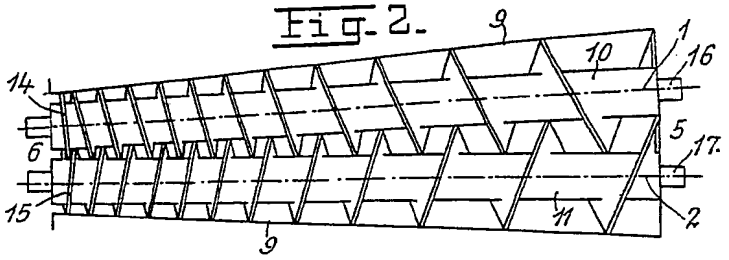
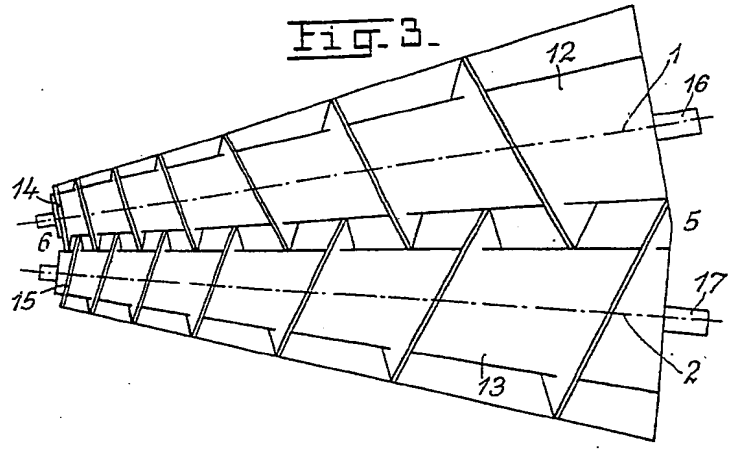


Fig. 3.



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